

This listing of claims will replace all prior versions and listings of claims in the application.

**Listing of Claims:**

1. (original) A brake control system, comprising:
  - a first pair of brake control units;
  - a second pair of brake control units;
  - a first brake control bus which is operatively connected to each of the respective ones of said first pair of brake control units;
  - a second brake control bus which is operatively connected to each of the respective ones of said second pair of brake control units;
  - a first supervisory controller which is operatively connected to said first brake control bus and adapted to control each of the respective ones of said first brake control unit pair through said first control bus;
  - a second supervisory controller which is operatively connected to said second brake control bus and adapted to control each of the respect ones of said second brake control unit pair through said second control bus;
  - a controller bus which is operatively connected to each of said first supervisory controller and said second supervisory controller; and
  - a monitoring controller which is operatively connected to said controller bus and adapted to monitor the performance of said first supervisory controller, said second supervisory controller, said first brake control bus, and said second brake control bus.
2. (original) The brake control system of claim 1, further comprising a brake control cutoff module, said module operatively connected by at least one controller signal line to said monitoring controller, said module also operatively connected by a first brake control line to said first pair of brake control units and by a second brake control line to said second pair of brake control units, wherein said

GMC3158

2 of 12

brake control cutoff module is adapted to receive a control input signal from said monitoring controller and selectively provide a control output signal to one of said first brake control unit pair and said second brake control unit pair, and wherein the control output signal comprises a cutoff command to the one of said pairs receiving the control output signal.

3. (original) The brake control system of claim 2, wherein the brake control cutoff module comprises a latching relay having embedded control logic to control the latching of the relay.

4. (original) The brake control system of claim 3, wherein the control output signal is selectively provided to one of said first pair of brake control units and said second pair of brake control units in accordance with the control logic.

5. (original) The brake control system of claim 4, wherein the at least one signal line comprises a first logic line and a second logic line, and wherein the first logic line may be selectively operatively connected through the control logic to the first brake control line and the second logic line may be selectively operatively connected through the logic to the second brake control line.

6. (original) The brake control system of claim 1, further comprising a brake control cutoff module, said module operatively connected by at least one controller signal line to said monitoring controller, said module also operatively connected by a first brake control line to a first bus control which is operatively connected to said first brake bus and by a second brake control line to a second bus control which is operatively connected to said second brake bus, wherein said brake control cutoff module is adapted to receive a control input signal from said monitoring controller and selectively provide a control output signal to one of said first bus control and said second bus control, and wherein the control output signal

comprises a cutoff command to the one of said first bus control and said second bus control receiving the control output signal.

7. (original) The brake control system of claim 6, wherein the brake control cutoff module comprises a latching relay having embedded control logic to control the latching of the relay.

8. (original) The brake control system of claim 7, wherein the control output signal is selectively provided to one of said first bus control and said second bus control in accordance with the control logic.

9. (original) The brake control system of claim 8, wherein the at least one signal line comprises a first logic line and a second logic line, and wherein the first logic line may be selectively operatively connected through the control logic to the first brake control line and the second logic line may be selectively operatively connected through the control logic to the second brake control line.

10. (original) The brake control system of claim 1, further comprising a means for selectively disabling one of said first pair of brake control units and said second pair of brake control units, said means in signal communication with said monitoring controller, said means connected by a first signal line to and in signal communication with said first pair of brake control units and connected by a second signal line to and in signal communication with said second pair of brake control units, said means adapted to receive a control input signal from said monitoring controller and communicate a control output signal in response thereto to disable one of said first brake control unit pair and said second brake control unit pair.

11. (original) The brake control system of claim 1, wherein said monitoring controller is adapted to provide a warning indication to an operator in the

event that one of said first brake control unit pair and said second brake control unit pair is disabled.

12. (original) The brake control system of claim 1, wherein said first supervisory controller and said monitoring controller comprise a first fail-silent pair and said second supervisory controller and said monitoring controller comprise a second fail-silent pair.

13. (original) The brake control system of claim 1, further comprising:

- a first brake sensor that is operatively connected to a brake actuation device and adapted to sense an operator input and provide a first unprocessed brake signal,
- a second brake sensor that is operatively connected to the brake actuation device and adapted to sense the operator input and provide a second unprocessed brake signal;
- a third brake sensor that is operatively connected to the brake actuation device and adapted to sense the operator input and provide a third unprocessed brake signal;
- a brake actuation module that is adapted to receive the first unprocessed brake signal, second unprocessed brake signal and third unprocessed brake signal and process these output signals to provide a processed brake signal, wherein said first supervisory controller is adapted to receive the first unprocessed brake signal and the processed brake signal and is adapted to control said first brake control unit pair in response thereto, and said second supervisory controller is adapted to receive the second unprocessed brake signal and the processed brake signal and is adapted to control said second brake control unit pair in response thereto, and said monitoring controller is adapted to receive the third unprocessed brake signal and the processed brake signal.

14. (original) A brake control system, comprising:

a first pair of brake control units;  
a second pair of brake control units;  
a first brake control bus which is operatively connected to each of the respective ones of said first pair of brake control units;  
a second brake control bus which is operatively connected to each of the respective ones of said second pair of brake control units;  
a first supervisory controller which is operatively connected to said first brake control bus and adapted to control each of the respective ones of said first brake control unit pair through said first control bus;  
a second supervisory controller which is operatively connected to said second brake control bus and adapted to control each of the respect ones of said second brake control unit pair through said second control bus;  
a controller bus which is operatively connected to each of said first supervisory controller and said second supervisory controller; and  
a monitoring controller which is operatively connected to said controller bus and adapted to monitor the performance of said first supervisory controller, said second supervisory controller, said first brake control bus, and said second brake control bus; and  
a brake control cutoff module, said module operatively connected by at least one controller signal line to said monitoring controller, said module also operatively connected by a first brake control line to said first pair of brake control units and by a second brake control line to said second pair of brake control units, wherein said brake control cutoff module is adapted to receive a control input signal from said monitoring controller and selectively provide a control output signal to one of said first brake control unit pair and said second brake control unit pair, and wherein the control output signal comprises a cutoff command to the one of said pairs receiving the control output signal.

15. (original) The brake control system of claim 14, further comprising:

a first brake sensor that is operatively connected to a brake actuation device and adapted to sense an operator input and provide a first unprocessed brake signal,

a second brake sensor that is operatively connected to the brake actuation device and adapted to sense the operator input and provide a second unprocessed brake signal;

a third brake sensor that is operatively connected to the brake actuation device and adapted to sense the operator input and provide a third unprocessed brake signal;

a brake actuator module that is adapted to receive the first unprocessed brake signal, second unprocessed brake signal and third unprocessed brake signal and process these output signals to provide a processed brake signal, wherein said first supervisory controller is adapted to receive the first unprocessed brake signal and the processed brake signal and is adapted to control said first brake control unit pair in response thereto, and said second supervisory controller is adapted to receive the second unprocessed brake signal and the processed brake signal and is adapted to control said second brake control unit pair in response thereto, and said monitoring controller is adapted to receive the third unprocessed brake signal and the processed brake signal.

16. (original) The brake control system of claim 15, wherein said first supervisory controller and said monitoring controller comprise a first fail-silent pair and said second supervisory controller and said monitoring controller comprise a second fail-silent pair.

17. (original) A brake control system, comprising:  
a first pair of brake control units;  
a second pair of brake control units;  
a first brake control bus which is operatively connected to each of the respective ones of said first pair of brake control units;

a second brake control bus which is operatively connected to each of the respective ones of said second pair of brake control units;

a first supervisory controller which is operatively connected to said first brake control bus and adapted to control each of the respective ones of said first brake control unit pair through said first control bus;

a second supervisory controller which is operatively connected to said second brake control bus and adapted to control each of the respective ones of said second brake control unit pair through said second control bus;

a controller bus which is operatively connected to each of said first supervisory controller and said second supervisory controller;

a monitoring controller which is operatively connected to said controller bus and adapted to monitor the performance of said first supervisory controller, said second supervisory controller, said first brake control bus, and said second brake control bus; and

a brake control cutoff module, said module operatively connected by at least one controller signal line to said monitoring controller, said module also operatively connected by a first brake control line to a first bus control which is operatively connected to said first brake bus and by a second brake control line to a second bus control which is operatively connected to said second brake bus, wherein said brake control cutoff module is adapted to receive a control input signal from said monitoring controller and selectively provide a control output signal to one of said first bus control and said second bus control, and wherein the control output signal comprises a cutoff command to the one of said first bus control and said second bus control receiving the control output signal.

18. (original) The brake control system of claim 17, further comprising:

a first brake sensor that is operatively connected to a brake actuation device and adapted to sense an operator input and provide a first unprocessed brake signal,

a second brake sensor that is operatively connected to the brake actuation device and adapted to sense the operator input and provide a second unprocessed brake signal;

a third brake sensor that is operatively connected to the brake actuation device and adapted to sense the operator input and provide a third unprocessed brake signal;

a brake actuator module that is adapted to receive the first unprocessed brake signal, second unprocessed brake signal and third unprocessed brake signal and process these output signals to provide a processed brake signal, wherein said first supervisory controller is adapted to receive the first unprocessed brake signal and the processed brake signal and is adapted to control said first brake control unit pair in response thereto, and said second supervisory controller is adapted to receive the second unprocessed brake signal and the processed brake signal and is adapted to control said second brake control unit pair in response thereto, and said monitoring controller is adapted to receive the third unprocessed brake signal and the processed brake signal.

19. (original) The brake control system of claim 18, wherein said first supervisory controller and said monitoring controller comprise a first fail-silent pair and said second supervisory controller and said monitoring controller comprise a second fail-silent pair.

20. (new) The brake control system of claim 1, further comprising a brake control cutoff module, said module operatively connected by at least one controller signal line to said monitoring controller, said module also operatively connected by a first brake control signal line in signal communication with said first pair of brake control units and by a second brake control signal line in signal communication with said second pair of brake control units, wherein said brake control cutoff module is adapted to receive a control input signal from said monitoring controller and selectively provide a control output signal to one of said

GMC3156

9 of 12



first pair of brake control units and second pair of brake control units, and wherein the control output signal comprises a cutoff command to the one of said first pair of brake control units and second pair of brake control units receiving the control output signal.

21. (new) The brake control system of claim 20 wherein said first brake control signal line is operatively connected to said first pair of brake control units through a first bus control and said second brake control signal line is operatively connected to said second pair of brake control units through a second bus control.

22. (new) The brake control system of claim 20 wherein said first brake control signal line is directly operatively connected to said first pair of brake control units and said second brake control signal line is directly operatively connected to said second pair of brake control units.